

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**



DEF 2EF  
1206m 307  
Attorney's Docket No.: 08935-244001 / M-4961

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Jane A. Blasi et al.  
Serial No. : 10/022,289  
Filed : December 14, 2001  
Title : ELECTROLYTE ADDITIVE FOR NON-AQUEOUS ELECTROCHEMICAL CELLS

Art Unit : 1745  
Examiner : Dah-Wei D. Yuan

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

REQUEST FOR REFUND

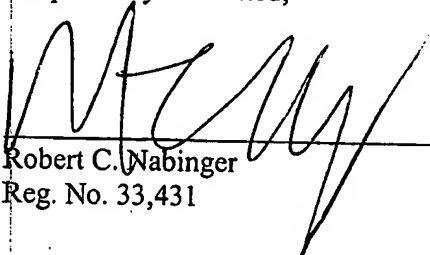
On or about December 17, 2003, Applicants filed an Amendment in Reply to Action Dated September 17, 2003, in which claims were withdrawn, cancelled and added. As Applicants had previously paid for more claims when the application was filed, no additional fees were due.

On January 31, 2004, fees in the amount of \$284.00 were charged to Fish & Richardson's Deposit Account No. 06-1050.

Accordingly, the charge to Deposit Account No. 06-1050 was improper, as all fees had previously been satisfied. Applicants respectfully request that the overcharge amount be refunded to Fish & Richardson's Deposit Account No. 06-1050 as a credit.

Respectfully submitted,

Date: 2/13/04

  
Robert C. Nabinger  
Reg. No. 33,431

Fish & Richardson P.C.  
225 Franklin Street  
Boston, MA 02110-2804  
Telephone: (617) 542-5070  
Facsimile: (617) 542-8906  
20806192.doc

CERTIFICATE OF MAILING BY FIRST CLASS MAIL

I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

February 13, 2004

Date of Deposit

  
Signature

Sherry L. Hunt

Typed or Printed Name of Person Signing Certificate

204 FEB 20 PM 4:54  
OFFICE OF REFUND BRANCH



PATENT APPLICATION FEE DETERMINATION RECORD  
Effective October 1, 2001

10022289

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	47	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	47 minus 20 =	27
INDEPENDENT CLAIMS	6 minus 3 =	3
MULTIPLE DEPENDENT CLAIM PRESENT <input type="checkbox"/>		

\* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	58	47	11
Independent	7	6	1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

BEST AVAILABLE COPY

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total			
Independent			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total			
Independent			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.  
\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."  
\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."  
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY TYPE <input type="checkbox"/>		OR		OTHER THAN SMALL ENTITY	
RATE	FEE	RATE	FEE	RATE	FEE
BASIC FEE	370.00	OR	BASIC FEE	740.00	
X\$ 9=		OR	X\$18=	1986	
X42=		OR	X84=	292	
+140=		OR	+280=		
TOTAL		OR	TOTAL	1476	

SMALL ENTITY		OR		OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=		
X42=		OR	X84=		
+140=		OR	+280=		
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE		

SMALL ENTITY		OR		OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=		
X42=		OR	X84=		
+140=		OR	+280=		
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE		

SMALL ENTITY		OR		OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=		
X42=		OR	X84=		
+140=		OR	+280=		
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE		

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Withdrawn) An electrochemical cell comprising a cathode, an anode, a current collector including aluminum, an electrolyte containing a perchlorate salt and a second salt, wherein the electrochemical cell is a secondary cell, and wherein the electrolyte is essentially free of  $\text{LiPF}_6$ .
2. (Withdrawn) The cell of claim 1, wherein the electrolyte contains at least 5000 ppm by weight of a perchlorate salt.
3. (Withdrawn) The cell of claim 2, wherein the electrolyte contains at least 10,000 ppm by weight of a perchlorate salt.
4. (Withdrawn) An electrochemical cell comprising a cathode containing  $\text{MnO}_2$ , an anode containing lithium, and an electrolyte containing a perchlorate salt, wherein the cell includes an aluminum surface in electrical contact with a second metal surface, wherein the second metal surface is different than the aluminum surface.
5. (Withdrawn) The cell of claim 4, wherein the second metal surface is a steel surface.
6. (Withdrawn) The cell of claim 4, wherein the second metal surface is a stainless steel surface.

7. (Withdrawn) The cell of claim 4, wherein the second metal surface is an aluminum or aluminum alloy surface.
8. (Withdrawn) The cell of claim 4, wherein the second metal surface is a nickel surface.
9. (Withdrawn) The cell of claim 4, wherein the cell includes a cathode current collector comprising aluminum.
10. (Withdrawn) The cell of claim 4, wherein the electrolyte contains about 500 to about 2500 ppm by weight of the perchlorate salt.
11. (Withdrawn) The cell of claim 4, wherein the perchlorate salt is  $\text{LiClO}_4$ .
12. (Withdrawn) The cell of claim 4, wherein the perchlorate salt is  $\text{Ca}(\text{ClO}_4)_2$ .
13. (Withdrawn) The cell of claim 4, wherein the perchlorate salt is  $\text{Ba}(\text{ClO}_4)_2$ .
14. (Withdrawn) The cell of claim 4, wherein the perchlorate salt is  $\text{Al}(\text{ClO}_4)_3$ .
15. (Withdrawn) The cell of claim 4, wherein the electrolyte is essentially free of  $\text{LiPF}_6$ .
16. (Withdrawn) The cell of claim 4, wherein the aluminum surface is a portion of an object having at least one dimension greater than 0.5 mm.
17. (Withdrawn) The cell of claim 4, wherein the aluminum surface is a portion of an object having at least one dimension greater than 1 mm.

18. (Withdrawn) The cell of claim 4, wherein the aluminum surface is a portion of an object having at least one dimension greater than 2 mm.

19. (Currently amended) An electrochemical cell comprising a cathode containing an aluminum current collector, an anode, and an electrolyte containing ~~a lithium salt and a~~ lithium perchlorate salt ~~and a lithium salt selected from the group consisting of LiTFS, LiTFSI, and LiPF<sub>6</sub>~~, wherein the cell is a primary electrochemical cell.

20. (Original) The cell of claim 19, wherein the cathode contains MnO<sub>2</sub>.

21. (Original) The cell of claim 19, wherein the anode contains lithium.

22. (Currently amended) The cell of claim 19, wherein the electrolyte contains at least 500 ppm by weight of the lithium perchlorate salt.

23. (Currently amended) The cell of claim 19, wherein the electrolyte contains at least 1000 ppm by weight of the lithium perchlorate salt.

24. (Currently amended) The cell of claim 19, wherein the electrolyte contains at least 1500 ppm by weight of the lithium perchlorate salt.

25. (Currently amended) The cell of claim 19, wherein the electrolyte contains at least 2500 ppm by weight of the lithium perchlorate salt.

26. (Currently amended) The cell of claim 19, wherein the electrolyte contains less than 20,000 ppm by weight of the lithium perchlorate salt.

27-30. (Cancelled)

31. (Original) The cell of claim 19, wherein the cell includes a case comprising aluminum.

32. (Original) The cell of claim 31, wherein the case consists essentially of aluminum.

33. (Cancelled)

34. (Currently amended) The cell of claim 19 ~~33~~, wherein the electrolyte contains at least 5000 ppm by weight  $\text{LiPF}_6$ .

35. (Original) The cell of claim 34, wherein the electrolyte contains at least 10,000 ppm by weight  $\text{LiPF}_6$ .

36. (Original) The cell of claim 19, wherein the electrolyte is essentially free of  $\text{LiPF}_6$ .

37. (Withdrawn) An electrochemical cell comprising a cathode containing  $\text{MnO}_2$ , an anode containing lithium, an aluminum surface, and an electrolyte containing about 500 ppm to about 2000 ppm by weight of a perchlorate salt.

38. (Withdrawn) The cell of claim 37, wherein the perchlorate salt is  $\text{LiClO}_4$ .

39. (Withdrawn) The cell of claim 37, wherein the perchlorate salt is  $\text{Ca}(\text{ClO}_4)_2$ .

40. (Withdrawn) The cell of claim 37, wherein the perchlorate salt is  $\text{Ba}(\text{ClO}_4)_2$ .



41. (Withdrawn) The cell of claim 37, wherein the perchlorate salt is  $\text{Al}(\text{ClO}_4)_3$ .
42. (Withdrawn) An electrochemical cell comprising a cathode containing  $\text{MnO}_2$ , an anode containing lithium, and an electrolyte containing a perchlorate salt, wherein the cell is a primary electrochemical cell, and wherein the cell includes two pieces of aluminum in electrical contact with each other.
43. (Withdrawn) A method of inhibiting aluminum corrosion in an electrochemical cell, the method comprising:
- (a) adding a perchlorate salt to an electrolyte; and
  - (b) placing the electrolyte, an anode containing Li, and a cathode containing  $\text{MnO}_2$  and an aluminum current collector into a cell case to form the cell, wherein the cell is a primary electrochemical cell.
44. (Withdrawn) The method of claim 43, wherein the perchlorate salt is  $\text{LiClO}_4$ .
45. (Withdrawn) The method of claim 43, wherein the perchlorate salt is  $\text{Ca}(\text{ClO}_4)_2$ .
46. (Withdrawn) The method of claim 43, wherein the perchlorate salt is  $\text{Ba}(\text{ClO}_4)_2$ .
47. (Withdrawn) The method of claim 43, wherein the perchlorate salt is  $\text{Al}(\text{ClO}_4)_3$ .
48. (New) An electrochemical cell comprising a cathode containing an aluminum current collector, an anode, and an electrolyte comprising salts consisting essentially of lithium salts and lithium perchlorate, wherein the cell is a primary electrochemical cell.
49. (New) The cell of claim 48, wherein the cathode contains  $\text{MnO}_2$ .

50. (New) The cell of claim 48, wherein the anode contains lithium.
51. (New) The cell of claim 48, wherein the electrolyte contains at least 500 ppm by weight of the lithium perchlorate.
52. (New) The cell of claim 48, wherein the electrolyte contains at least 1000 ppm by weight of the lithium perchlorate.
53. (New) The cell of claim 48, wherein the electrolyte contains at least 1500 ppm by weight of the lithium perchlorate.
54. (New) The cell of claim 48, wherein the electrolyte contains at least 2500 ppm by weight of the lithium perchlorate.
55. (New) The cell of claim 48, wherein the electrolyte contains less than 20,000 ppm by weight of the lithium perchlorate.
56. (New) The cell of claim 48, wherein the cell includes a case comprising aluminum.
57. (New) The cell of claim 56, wherein the case consists essentially of aluminum.
58. (New) The cell of claim 48, wherein one of the lithium salts comprises  $\text{LiPF}_6$ .
59. (New) The cell of claim 58, wherein the electrolyte contains at least 5000 ppm by weight  $\text{LiPF}_6$ .

60. (New) The cell of claim 59, wherein the electrolyte contains at least 10,000 ppm by weight  $\text{LiPF}_6$ .

61. (New) The cell of claim 48, wherein the electrolyte is essentially free of  $\text{LiPF}_6$ .

### REMARKS

Applicants amended claims 19, 22-26, and 34, added new claims 48-61, and cancelled claims 27-30 and 33 without prejudice. Claims 19-26, 31, 32, 34-36, and 48-61, of which claims 19 and 48 are independent in form, are pending in this application. Applicants address the Examiner's rejections below.

#### 35 U.S.C. § 102(e)

The Examiner rejected claims 19-30 and 33-36 under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,165,644 ("Nimon"), as evidenced by U.S. Patent Application No. US 2003/0143112 A1 ("Suslick"). Applicants have cancelled claims 27-30, thereby obviating the rejection of those claims. As amended, claims 19-26 and 33-36 recite an electrochemical cell comprising an electrolyte containing lithium perchlorate and a lithium salt selected from the group consisting of LiTFS, LiTFSI, and LiPF<sub>6</sub>.

Nimon does not describe or suggest an electrochemical cell comprising an electrolyte that contains both lithium perchlorate and LiTFS, LiTFSI, or LiPF<sub>6</sub>. While Nimon provides a list of examples of optional lithium salts for an electrolyte (e.g., lithium perchlorate, LiPF<sub>6</sub>), Nimon does not describe or suggest the use of more than one of these lithium salts in an electrolyte. (See, e.g., Nimon, col. 10, lines 13-24.) In other words, Nimon does not describe or suggest using both lithium perchlorate and another lithium salt (such as LiPF<sub>6</sub>) in an electrolyte. In fact, Nimon explains that even including one of the listed lithium salts in the electrolyte is optional because the battery in Nimon preferably includes sulfur, and "upon discharge of the battery the metal sulfides or polysulfides formed can act as electrolyte salts . . . ." (See Nimon, col. 2, lines 29-40; col. 10, lines 20-24). Thus, Applicants request the withdrawal of the § 102(e) rejection of claims 19-30 and 33-36 on the basis of Nimon.

#### 35 U.S.C. § 103(a)

The Examiner rejected claims 31 and 32 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,165,644 ("Nimon"), and further in view of U.S. Patent No. 6,352,793

("Kitoh"). Claims 31 and 32 depend from claim 19 which, as amended, recites an electrolyte containing lithium perchlorate and a lithium salt selected from the group consisting of LiTFS, LiTFSI, and LiPF<sub>6</sub>.

Nimon does not describe or suggest such an electrolyte, as described above, and Kitoh does not correct the deficiencies of Nimon. While Kitoh describes, for example, the preparation of an electrolyte for a battery by dissolving LiPF<sub>6</sub> in a mixed solution of ethylene carbonate and diethyl carbonate, Kitoh does not describe or suggest a battery electrolyte that includes lithium perchlorate and LiTFS, LiTFSI, or LiPF<sub>6</sub>. (See, e.g., Kitoh, col. 6, lines 30-32). In fact, Kitoh does not even mention using lithium perchlorate in an electrolyte. Thus, Applicants request the withdrawal of the § 103(a) rejection of claims 31 and 32 on the basis of Nimon and Kitoh.

#### **New Claims**

New claims 48-61 are also patentable over the cited references because none of the references, alone or in combination, discloses or suggests an electrochemical cell comprising a cathode containing an electrolyte comprising salts consisting essentially of lithium salts and lithium perchlorate. While Nimon describes an electrolyte that includes Li<sub>2</sub>S<sub>8</sub> and LiTFSI, Nimon does not describe or suggest an electrolyte that includes lithium perchlorate and at least two other lithium salts. (See Nimon, col. 3 lines 24-43).

#### **Double Patenting**

The Examiner provisionally rejected claims 19-36 under the doctrine of obviousness-type double patenting as unpatentable over claims 12-24 of copending and commonly owned Application No. 10/361,945 (US 2003/0124421 A1). Applicants request that the rejection be reconsidered in view of the amendments to the present claims. If the Examiner maintains the rejection, and the claims are otherwise allowable, Applicants will consider submitting an appropriate terminal disclaimer at that time.

Applicants believe that the claims are in condition for allowance, which action is requested.

Applicant : Jane A. Blasi et al.  
Serial No. : 10/022,289  
Filed : December 14, 2001  
Page : 11 of 11

Attorney's Docket No.: 08935-244001 / M-4961

Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: DECEMBER 17, 2003

Tu N. Nguyen  
Tu N. Nguyen  
Reg. No. 42,934

Fish & Richardson P.C.  
225 Franklin Street  
Boston, MA 02110-2804  
Telephone: (617) 542-5070  
Facsimile: (617) 542-8906

20767656.doc